Transitionen von der Erstausbildung ins Erwerbsleben
Transitions de l'Ecole à l'Emploi
Transitions from Education to Employment

The Intellectual Demands of Initial Vocational Education and Training in Switzerland

Ratings for the period 1999-2005

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PREFACE

This report describes the methods and results of several ratings conducted to assess the intellectual demands of more than 100 apprenticeships in Switzerland. It assembles the various working papers on the individual ratings (Stalder, 2000a, 2002, 2005) and adds to this work by providing a validation of the 2005 rating.

The rating results give a global assessment of the intellectual demands of each apprenticeship on a scale from 1 (low) to 6 (high) and are primarily intended for comparative quantitative research in the field of vocational education and training (VET). Classification according to the level of intellectual demands makes it possible to better take into account the variety of VET programmes in terms of the standards of performance that they require and allows to consider such differences in analyses in more detail than has hitherto been possible. For the practical purposes of career counselling the assessment study will probably not provide a substantial contribution beyond offering some additional information since a wide range of excellent resources on career choice are already available.

I would like to express my gratitude to the Canton of Berne for the longstanding support provided to the project. A special thanks goes to the staff of the career counselling agencies for participating in the three ratings and to the Office of Education Research (*Amt für Bildungsforschung*) for funding the research project "Recruitment and Selection of Apprentices". Finally, I would like to extend my appreciation to the Institute of Sociology at the University of Basel for the opportunity to publish this report.

Basel, February 2011

Dr. Barbara E. Stalder

1 SITUATION AT THE OUTSET

The situation leading to the rating presented here was the emerging shortage of apprenticeship places in the late 1990s, which, at the same time, was accompanied by frequent complaints from companies about applicants whose academic achievements were insufficient to keep up with the growing demands of vocational education and training (VET) (cf. Gartz, Hüchtermann, & Myrtz, 1999; Geser, 1999). The research project "We are looking for … – Recruitment and Selection of Apprentices in the Canton of Berne" (Stalder, 2000b) was conceived to investigate how this gap between applicant skills and company requirements might be explained.

The objective was to find a measure allowing to determine the demands of upper secondary VET. Such a measure should be applicable to all occupations and, in a condensed form, give information about the intellectual skills minimally required to successfully complete a specific VET programme. The level of demands should be derived from the curriculum and the education goals of the apprenticeship as defined by the respective vocational education and training (*Bildungsverordnung*, formerly *Ausbildungsreglement*) and the educational plan (*Bildungsplan*). Intellectual demands should be conceived as a factor in its own right, which can be defined independently of other abilities and skills, such as practical or social skills, that are also required to graduate from a VET programme. The demands must also be determined independently of particular requirements and selection criteria specific to certain kinds of employers. With an eye to broader applicability in education research, the rating system should remain open to approaches that depart from the simple dichotomy of "upper secondary general education for university entrance qualification/academic matura (*Gymnasium*) for the academically most talented students and VET for the rest". The rating system aims at allowing for a more fine-grained analytical perspective that is better suited to do justice to the variety of demands across the wide range of VET programmes, thus facilitating comparative research of VET in Switzerland.

In order to determine the intellectual demands of VET programmes, it has been common practice to resort to the previous education *required*, especially the minimal requirements in terms of the type of lower secondary school that was attended or the grades achieved in mathematics and the language of instruction. Those criteria have the advantage of being both easily assessable via school reports and commonly accepted as an approximation of educational achievements. Yet they have two crucial disadvantages. Firstly, the Swiss cantons have very different school systems so that educational achievements, as determined by type of school and grades, is a poor measure of comparison not only between cantons but also between schools and even classes. Secondly, relying on the previous education *required* runs the risk of assessing the demands of apprenticeships based on conceptions of the ideal applicant and the current situation in the apprenticeship market instead of gauging the *actual* educational and intellectual demands that must be satisfied to successfully complete VET. For instance, occupations in high demand can afford to apply higher standards in selecting apprentices compared to occupations that attract only few applicants. VET curricula defined at the national level therefore require a measure that determines the demands of apprenticeships without resort to performance indicators based on lower secondary education (type of school, grades).

2 METHODS USED IN COLLECTING THE BASELINE DATA (RATING 1999)

The research project "We are looking for … – Recruitment and Selection of Apprentices in the Canton of Berne" (Stalder, 2000b) employed three different approaches in analyzing the intellectual demands of various apprenticeships: a survey of in-company vocational training personnel in the canton of Berne concerning the selection criteria applied in choosing apprentices, an analysis of available statistical data on transitions from education to employment, and a rating conducted by career counsellors in the canton of Berne.

In a first step, 1500 in-company trainers for 37 different kinds of apprenticeships were asked about the educational background required for applicants to have a chance of being shortlisted for an apprenticeship. We were interested in whether young graduates from lower secondary schools with basic requirements (*Realschule,* "basic track") have lower, equal or better chances than their peers who graduated from lower secondary schools with advanced requirements (*Sekundarschule,* "advanced track").[1]

In a second step, we examined the actual educational background of VET participants based on the education statistics of the canton of Berne. Specifically, we analyzed the transition matrices from 1995 to 1998, which show the education and employment status of the apprentices one year before entering the apprenticeship. According to our survey of companies providing training and our analysis of the transition matrices, we were able to classify most of the apprenticeships under study as either a "basic track occupation" (*Realschulberuf*) or an "advanced track occupation" (*Sekundarschulberuf*). In the case of basic track occupations, the companies surveyed considered basic track graduates to have better chances of being chosen compared to advanced track graduates, which is also reflected in a higher actual share of basic track graduates in those apprenticeships compared to advanced track graduates. Conversely, we encountered a few advanced track occupations (e.g., clerk in business administration, electronics technician, structural draughtsperson) where the companies perceived basic track graduates to have only minimal chances of being selected for an apprenticeship position and where the share of such graduates was very low (cf. Stalder 2000b for a detailed account of the job requirements and the situation in the apprenticeship market for 37 occupations at the time).

Finally, we analyzed the requirements of the same 37 apprenticeships from the perspective of career counsellors. They were asked to assess the intellectual demands on a scale ranging from 1 (low) to 3 (high). The level of intellectual demands was defined as the cognitive skills needed to master the requirements of an apprenticeship. In addition, the career counsellors were to indicate the previous education generally required for those learning a specific trade in order to come to grips with its intellectual demands without particular difficulties. The counselling teams of 13 regional Career Counselling and Information Centres (*Berufsberatungs- und Informationszentrums – BIZ*) in the canton of Berne participated in rating the 37 apprenticeships. In a first step, the individual counsellors responsible for specific occupational groups rated the apprenticeships. The regional teams then discussed and consolidated the ratings. The results of the rating process conducted in 1999 are compiled in Figure 1.

[1] The canton of Berne has a two-tiered school system (total number of students in ninth grade in 1999: basic track 4576 and advanced track 4173, cf. Stalder 2000b). The advanced track of upper secondary education starts in the ninth grade of the advanced-level secondary schools or the upper secondary schools of general education (*Sekundarschule* or *Maturitätsschule*). For details on the school system in Berne, see www.erz.be.ch.

Figure 1

Intellectual demands and minimum level of previous education required as rated by the 13 career counselling agencies in the canton of Berne (1999)

		Basic track education			Advanced track education		
Mean level of demands (Scale 1-3)	***Apprenticeships***	with average grades	with above average talent in math/ languages	plus 10th year of school	with average grades	with above average talent in math/ languages	plus 10th year of school
3.0	Druggist (non-dispensing)	0	3	12	10	13	13
3.0	Electronics technician	0	2	12	1	13	13
3.0	Construction mechanic	0	6	13	5	13	13
3.0	Clerk	0	5	12	11	13	13
3.0	Graphic designer	0	5	13	6	13	13
2.8	Architectural draughtsperson	0	8	13	6	13	13
2.8	Optometrist	0	5	12	7	13	13
2.8	Structural draughtsperson	0	6	13	6	13	13
2.8	Polymechanic	1	11	13	13	13	13
2.7	Radio and television technician	0	8	12	8	13	13
2.5	Automotive mechatronics technician	0	12	13	11	13	13
2.4	Electrical fitter	1	12	13	12	13	13
2.3	Retail sales worker	0	7	13	12	13	13
2.2	Agricultural mechanic	3	13	13	12	13	13
2.1	Pharmacy assistent	1	7	13	13	13	13
2.0	Cabinet maker	5	12	13	13	13	13
2.0	Sheet metal worker-plumber	4	13	13	12	13	13
1.9	Printer	7	13	13	13	13	13
1.8	Plumber	12	13	13	13	13	13
1.8	Carpenter	5	12	13	13	13	13
1.7	Heating technician	10	13	13	13	13	13
1.6	Florist	12	13	13	13	13	13
1.5	Landscape gardener	13	13	13	13	13	13
1.4	Automechanic	12	13	13	13	13	13
1.3	Cook	13	13	13	13	13	13
1.3	Gardener (ornamental plant culture)	13	13	13	13	13	13
1.3	Salesperson	13	13	13	13	13	13
1.2	Hairdresser	13	13	13	13	13	13
1.1	Painter	13	13	13	13	13	13
1.1	Baker/ pastry cook	13	13	13	13	13	13
1.0	Hotel services assistent	13	13	13	13	13	13
1.0	Brick layer	13	13	13	13	13	13
1.0	Butcher	13	13	13	13	13	13
1.0	Restaurant services assistent	13	13	13	13	13	13

Legend

Is the person capable of mastering the demands?

13 definitely YES

12

11 YES

10

9

8

7 Controversial

6

5

4

3

2 NO

1

0 definitely NO

5 Number of career counselling agencies answering in the affirmative

Note:
The occupations metalworker, mechanic, and mechanical draughtsperson are missing. At that time, they were incorporated into the newly created apprenticeship "construction mechanic".

According to the career counsellors' assessments in 1999, four apprenticeships were rated as having the highest level of demands (=3) and five as having the lowest level (=1).

Roughly 15 of the apprenticeships listed above were considered (also) suitable for the average basic track graduate without any limitations, that is to say, the average graduate should be

able to complete VET in these occupations without facing intellectual demands that he or she is ill-equipped to live up to. At the other end of the demands scale are about eight apprenticeships the requirements of which can only be mastered with an advanced-level education and special talent in mathematics and/or languages. However, all career counsellors agreed that attending a tenth year of school is sufficient to provide access to all apprenticeships, including the intellectually most demanding ones.

3 Rating Expanded to Include 76 Apprenticeships (2002)

Three years after the first rating, the classification of apprenticeships was reviewed, and the initial assessment was updated and expanded. The original list comprising 37 apprenticeships was corrected (for occupations no longer included among the apprenticeships officially recognized by VET regulations) and new occupations were added. The instrument for assessing the level of intellectual demands was expanded to a six-point scale (from 1=low intellectual demands to 6=high intellectual demands). This time there was no assessment of the previous education required. The survey was limited to the largest Career Counselling and Information Centre in the canton, which is in the city of Berne.

A list of 76 apprenticeships was presented to the Centre staff. The level of demands was listed for 58 apprenticeships, based on the initial ratings from 1999 and other older assessments (R. Müller, 2001; Schallberger, 1982), and presented to the staff, asking them to check and, if necessary, correct those ratings. In 18 cases, the apprenticeships had not previously been rated, and the counsellors were requested to do so for the first time. The results of the second rating are given in Table 1. With a few exceptions, the demands assessments of the previous rating were confirmed.

Table 1
Intellectual demands of 76 apprenticeships;
rating by the Career Counselling and Information Centre of the city of Berne (2002)

Level of demands	Apprenticeship
1	Auto body painter; baker/pastry cook, hairdresser; forest manager; gardener; hotel services assistant; pastry cook/confectioner; ceramic/pottery maker; painter; brick layer; butcher; caregiver; tiler; smith; restaurant services assistant; animal keeper; salesperson
2	Auto mechanic; auto body mechanic; dressmaker; bicycle and motorcycle mechanic; florist; galvanizer; restaurant services assistant; goldsmith; housekeeping manager; heating technician; cook; beautician; metalworker; dairy technician; sheet metal worker; road construction operative; carpenter
3	Boatbuilder; decorator; dental assistant; printer; photo technician; chimney sweep; clerk (basic track education); farmer; truck driver; logistics assistant; medical assistant; pharmacy assistant; plumber; cabinet maker; veterinary assistant
4	Plant and mechanical engineering technician; automotive mechatronics technician; retail sales worker; electrical fitter; photographer; graphic designer; early childhood teacher; agricultural mechanic; micromechanic; polymechanic; dental technician
5	Multi-media specialist; optometrist; automation technician; architectural draughtsperson; non-dispensing druggist; surveyor; nurse (advanced track education); laboratory technician; multi-media electronics technician; graphic designer
6	Electronics technician; IT technician; clerk (advanced track education); construction mechanic

4 RATING EXPANDED TO INCLUDE 101 APPRENTICESHIPS (2005)

In 2005, a third rating was conducted, which again involved updating and expanding the classification system to include 101 apprenticeships. The same rating procedure was applied.

The results are listed in Table 2. An additional version in four languages can be found in the annex.

Table 2
Intellectual demands of 101 apprenticeships;
rating by the Career Counselling and Information Centre of the city of Berne (2005)

Level of demands	Apprenticeship
1	Auto body painter; baker/pastry cook, insulation worker; concrete mason; facility manager; floor layer; hairdresser; forest manager; gardener; pastry cook/confectioner; ceramic/pottery maker; painter; brick layer; production mechanic; butcher; caregiver; tiler; smith; animal keeper
2	Auto mechanic; tailor/dressmaker; auto body mechanic; roofer; electrical worker; vehicle body builder; florist; galvanizer; goldsmith; weaver; housekeeping manager; heating technician; hotel services assistant (EFZ); cook; beautician; metalworker; dairy technician; electrical fitter; restaurant services assistant (EFZ); sheet metal worker (construction); road construction operative; viticulturist; train conductor; bike mechanic; carpenter
3	Construction equipment mechanic; horse groom/rider; boat builder; chemical technician; decorator; dental assistant; printer; healthcare assistant; photo technician; in-home caregiver; chimney sweep; clerk (basic track education); farmer; truck driver; logistics assistant; medical assistant; motor equipment mechanic; motorcycle mechanic; electrician for electrical and telecommunications infrastructure; pharmacy assistant; sheet metal worker-plumber; veterinary assistant; food technician; clockmaker.
4	Plant and mechanical engineering technician; automotive mechatronics technician; electrician; auto electrician/electronics technician; photographer; graphic designer; building service technician; early childhood teacher; agricultural mechanic; landscape draughtsperson; micromechanic; polymechnic; cabinet maker; dental technician
5	Optometrist; automation technician; architectural draughtsperson; biological laboratory technician; bookseller; chemical laboratory assistant; non-dispensing druggist; electrical planner; surveyor; medical laboratory technician; multi-media electronics technician; graphic designer
6	Electronics technician; IT technician; clerk (advanced track education); construction mechanic; multi-media specialist

Note:
The following were not newly rated in 2005: Nurse (advanced track education – now requires tertiary education); retail sales worker (the former apprenticeships "*Detailhandelsangestellte/r*" and "*Verkäufer/in*" have been replaced by the new apprenticeships "*Detailhandelsfachfrau/-mann EFZ*" and "*Detailhandelassistent/in EBA*"); tailor/dressmaker ("*Damenschneider/in"* replaced by "*Bekleidungsgestalterin*"); bicycle and motorcycle mechanic (replaced by bike mechanic); restaurant services assistant and hotel services assistant ("*Gastronomiefachassistent/in*" and "*Hotelfachassistent/in*" replaced by "*Restaurationsfachmann/-frau EFZ*" and "*Restaurationsangestellte/r EBA*")

5 VALIDITY OF THE RATING

Validating the rating would ideally require comparing the curricula of all apprenticeships and performance assessments that could be conducted at the beginning and upon completion of initial VET. However, such a procedure would be very time- and resource-consuming and would hardly be able to keep up with the current pace of change in the VET landscape (see section 6). For this reason, we have turned to other parameters for validating the instrument and assessing the 2005 rating (cf. Bortz & Döring, 2006).

First, we compare the 2005 rating with two other ratings: a somewhat older rating of intellectual demands by Romano Müller (2001) and the previous education required according to the SDBB[2] classification (for construct validation). We expect both measures to correlate highly with the level of demands since they both measure the same construct, i.e. the intellectual demands of VET programmes. Subsequently, we examine empirically the relationship between level of demands and the length of the apprenticeship, the type of school actually attended at the lower secondary level, as well as competencies in mathematics and reading upon completion of compulsory education (criteria validation). We expect medium-level correlations (<.5).

Level of demands and R. Müller's rating

Romano Müller's rating, which is also based on Schallberger's Zurich rating (1982), includes approximately 130 occupations. Three career counsellors were asked to again rate those occupations in 1998/99. Müller defines the level of occupational demands (*berufliches Anspruchsniveau – BAN*) as "the intellectual and educational requirements that must be satisfied to learn and pursue an occupation" (R. Müller, 2001, p. 279 – translated from German). As opposed to the rating by Stalder discussed here, which focuses exclusively on apprenticeships, Müller makes no explicit distinction between "the occupation trained for" (*Lehrberuf*) and "the occupation employed in" (*Erwerbsberuf)* and also includes unskilled occupations (BAN1) and professions requiring tertiary education (BAN8). The VET-based occupations are rated on a scale from BAN2 to BAN7. Examples are: BAN2: baker/pastry cook, butcher, hairdresser, preparatory vocational training programmes; BAN3: cook, bricklayer, heating technician; BAN4: cabinet maker, electrical fitter, pharmacy assistant, retail sales worker; BAN5: optometrist, non-dispensing druggist, automation technician; BAN6: polymechanic, structural draughtsperson, clerk; BAN7: vocational matura[3] (*Berufsmaturität*), electronics technician, IT technician, graphic designer (cf. R. Müller, 2009, pp. 118 ff).

The correlation between the 2005 Stalder rating and the Müller rating is r=.88 (p<.001; N=43 apprenticeships[4]). Both ratings are very similar, which indicates good convergent validity of the 2005 rating. The fact that both Müller and Stalder conducted their ratings with experienced career counsellors in the canton of Berne is probably a factor contributing to the good agreement between the results of the two ratings.

[2] *SDBB: Schweizerisches Dienstleistungszentrum Berufsbildung | Berufs-, Studien- und Laufbahnberatung* (Swiss VET Service Centre | Career Counseling Services). SDBB is a professional service institution of the Swiss Conference of Cantonal Ministers of Education.

[3] Advanced vocational degree, which allow access to universities of applied science.

[4] To my knowledge, Müller's results have only been partially published (R. Müller, 2009).

Level of demands and previous education required

Educational foundations and intellectual capacity are two factors among many others that play a role in whether youths are capable of successfully meeting the demands of an apprenticeship (Kühnis, 1986; Zihlmann, 1998). In practice, especially in career counselling and in choosing apprentices, assessments are frequently made based on the type of lower secondary school attended as an indicator for whether or not educational requirements are fulfilled (Hirschi, 2009; Imdorf, 2009; Moser, 2004; Stalder, 2000b).

The educational requirements, as perceived by counselling experts, are described on the SDBB website *www.berufsberatung.ch*[5]*.* Roughly speaking, we can distinguish three levels of demands. Level 1 comprises apprenticeships that can be mastered by graduates from the basic track of lower secondary education (*Realschule*). Level 2 consists of apprenticeships that require successful completion of the basic track and good grades in core subjects. Level 3 includes apprenticeships requiring attendance of the advanced track of lower secondary education (*Progymnasium* or *Sekundarschule*).

As is to be expected, comparison of demands and the previous education required according to SDBB shows that both factors are strongly correlated. The more demanding an apprenticeship, the higher the level of previous education expected and vice versa (Table 3).

The correlation between the Stalder rating and required previous education shows a relatively high *Spearman's rho* of .71. Previous school education thus seems to be a fairly good proxy for the level of demands of an apprenticeship.

Table 3
Intellectual demands and previous education required according to SDBB

		Level of demands of Initial VET 2005						
		1	2	3	4	5	6	Mean
Required lower secondary education	Successful completion of compulsory education (basic track)	16	19	13	4	0	0	2.1
	Successful completion of compulsory education (basic track) plus good grades in core subjects	0	4	10	6	2	2	3.5
	Successful completion of compulsory education (advanced track)	0	0	1	4	7	3	4.8
	N apprenticeships	16	23	24	14	9	5	

*www.berufsberatung.ch; $Chi^2(10)=62.83$, p<.001; *Spearman's rho*=.71, p<.001

Detailed analysis shows that educational background is a particularly strong factor in regulating access to apprenticeships with demands ranging in the top two levels (no access for youths with basic track education). The assessments vary considerably in regard to previous education required for occupations with medium-level demands. Graduating from basic track education satisfies the educational requirements of 52 of the 91 apprenticeships rated – ranging from level 1 to 3 and even to 4. A basic track graduate with good grades can even choose from 76 occupations across all levels of demands.

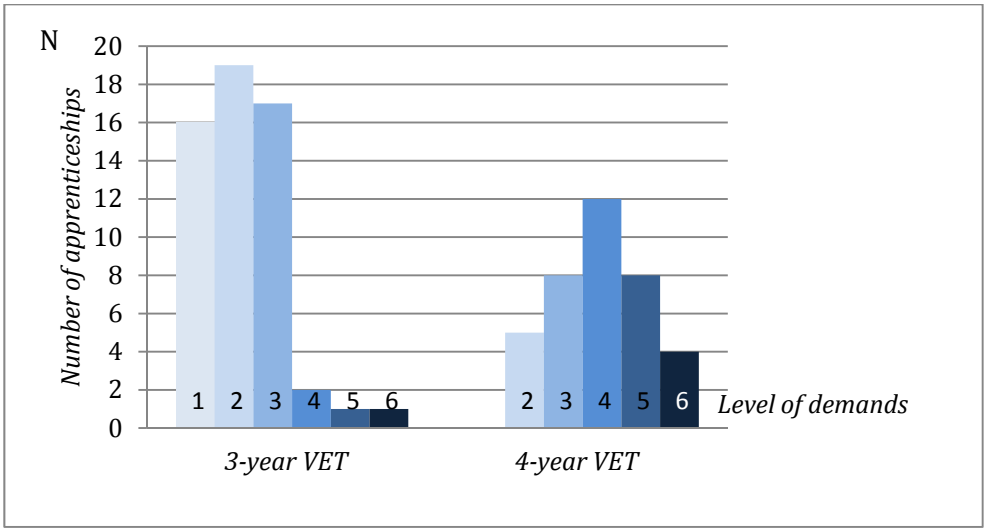
[5] In German; French: www.orientation.ch; Italien: www.orientamento.ch

Level of demands and length of apprenticeships

In comparative education research, length of education is often taken as an indicator of the achieved level of education (cf. e.g. OECD, 2008): the longer an education, the more demanding it is considered to be and the higher the level of educational/occupational qualification that is assumed to have been achieved. This also holds for initial VET programmes. VET programmes for less academically and more practically talented students resulting in a Federal VET Certificate take two years. VET resulting in a Federal VET Diploma take three to four years, but the three-year apprenticeships are less demanding in terms of school education than the four-year ones.

A graphic representation of the three- and four-year apprenticeships by intellectual demands is given in Figure 2.

Figure 2
Intellectual demands by length of VET



Chi² (5)=39.6, p<.001; *r*=.61, p<.001

According to the rating, *three-year* apprenticeships pose low to medium intellectual demands on the apprentices. For 52 of the 56 three-year apprenticeships, the level of demands is 3 or lower. Exceptions with higher or high demands are, for instance, apprenticeships to become a clerk (advanced track education (level 6) or a laboratory technician (level 5). Contrary to expectations, *four-year* initial VET is not consistently rated as having medium- or high-level demands, rather the assessments vary considerably. Of the 37 four-year initial VET programmes, only 12 are classified as level 5 or 6, 20 at the medium levels 3 or 4, and 5 at the low level of 2.

Short VET programmes – with some exceptions – are thus generally associated with lower intellectual demands, but longer ones not necessarily with higher demands. The correlation between level of demands and length of the apprenticeship at *r*=.61 is higher than expected. Nevertheless, in the light of the results discussed above, we may conclude that length of VET is not a sufficiently precise indicator of the intellectual demands of apprenticeships.

Level of demands and type of lower secondary education attended

Above, we employed the career counsellors' assessments of *required* previous education as a validation criterion. In the following, I will investigate to what extent *actual* school education correlates with the demands of apprenticeships in the first year of training based on data from the Swiss youth panel survey TREE (Bergman, Hupka-Brunner, Meyer, Keller & Stalder, 2011). The type of lower secondary education attended will serve as a measure of previous education.

Assuming that previous education is only one among several other criteria employed by companies in selecting apprentices (Imdorf, 2009; Stalder, 2000b), we can expect a medium-strong relation between type of lower secondary education attended and level of demands. Moreover, the *empirically* observed relation should be lower than the one between previous education and demands as assessed by the counsellors.

Table 4 shows the distribution of youths by intellectual demands of initial VET and type of lower secondary education attended based on the analyses of the TREE panel survey.

Table 4
Intellectual demands by type of lower secondary education attended; TREE analyses

		Level of demands of initial VET						
		1	2	3	4	5	6	Mean
Type of lower-sec. education (2000)	Basic track (*Realschule*)	64%	59%	44%	34%	22%	15%	3.0
	Advanced track (*Sekundarschule*)	30%	32%	37%	49%	52%	57%	4.4
	Advanced track leading to upper secondary general education (*Progymnasium*)	5%	9%	18%	17%	26%	27%	4.8
	% total	100%	100%	100%	100%	100%	100%	
	N youths	280	220	227	308	151	638	1824

Data sources: PISA 2000 and TREE wave 1 (2001), all of Switzerland; sample consists of youths who are enrolled in VET one year after leaving school (=direct entry), unweighted analyses
$Chi^2(10)=301.9$, $p<.001$

The analyses confirm the expected relation between type of education and VET demands in the first year after leaving compulsory schooling. Youths who completed lower secondary education in tracks designed to qualify for upper secondary general education (*Progymnasium*) and then switched to VET tend to enrol in more demanding apprenticeships (mean demands level 4.8). The same holds for youths who attended advanced track lower secondary education (mean 4.4). Youths graduating from schools of basic track education enter apprenticeships with medium-level demands (mean 3).

However, the correlation between type of school actually attended and level of VET demands is only moderate (*Spearman's rho*=.38; p<.001). Moreover, the correlation is considerably lower than the relation between *required* education and level of demands (*Spearman's rho*=.71). This difference persists even when treating previous education as a dichotomous variable in the analysis (1: basic track; 2: advanced track, incl. *Progymnasium*; $r_{\text{school attended X demands}}=.39$; $r_{\text{previous education X demands}}=.56$).

The required education – according to SDBB – hence does not always correspond with the actual education pathway. For instance, youths having completed basic track education are found in all apprenticeships, including the most demanding ones. Conversely, youths who

graduated from the most advanced track of lower secondary education (*Progymnasium*) also pursue apprenticeships with lower intellectual demands. This comes as no surprise: several other factors affecting one's own choices and those of others come into play at the interface between lower and upper secondary education that are independent of purely educational criteria and influence which path of education youths opt for after completing compulsory education.

Level of demands and PISA competencies upon completion of postcompulsory school

In a final step, I will examine the relation between competencies youths have acquired by the end of compulsory schooling and the demands of subsequent VET. As in the previous section, we will focus not on the *required* but the actually achieved competencies. The following analyses are again based on TREE survey data.

Table 5
Intellectual demands and PISA competencies; TREE analyses

		Level of demands of initial VET						
		1	**2**	**3**	**4**	**5**	**6**	**Mean**
Reading	0	7%	6%	3%	3%	3%	1%	2.6
skill	1	23%	17%	19%	11%	3%	5%	2.8
level	2	33%	36%	27%	29%	19%	16%	3.4
PISA 2000	3	29%	29%	35%	36%	41%	43%	4.2
	4	7%	9%	13%	19%	28%	30%	4.8
	5	1%	3%	2%	2%	7%	6%	4.8
	% total	100%	100%	100%	100%	100%	100%	
	N	295	228	235	332	160	671	1921
		1	**2**	**3**	**4**	**5**	**6**	**Mean**
Mathematics	0	6%	5%	6%	2%	0%	1%	2.6
skill	1	17%	9%	11%	4%	3%	3%	2.7
level	2	42%	40%	28%	28%	17%	24%	3.5
PISA 2000	3	29%	34%	46%	47%	45%	44%	4.1
	4	6%	13%	8%	18%	32%	25%	4.7
	5	0%	0%	1%	2%	3%	3%	5.3
	% total	100%	100%	100%	100%	100%	100%	
	N	173	128	141	185	98	365	1090

Data sources: PISA 2000 and TREE wave 1 (2001), all of Switzerland; sample consists of youths who are enrolled in VET one year after leaving school (=direct entry), unweighted analyses;
reading $Chi^2(25)=292.8$, $p<.001$; mathematics $Chi^2(25)= 151.1$, $p<.001$

Table 5 shows the relation between proficiency in reading and mathematics as measured by PISA and the demands of VET in the first year after completion of compulsory schooling.

The analyses again confirm the relationship that was expected between achieved PISA competencies and the demands of VET.

The correlations between the level of demands and the proficiency levels measured by PISA are of medium strength (r=.34, p<.001 for reading and r=.38, p<.001 for mathematics). This suggests that the transition to VET is strongly influenced by factors other than educational achievement.

6 DISCUSSION AND PROSPECTS

The purpose of the multiple rating procedure was to create an instrument for transition and education research that allows to classify initial VET programmes according to the level of "intellectual demands". Such a classification system departs from the simple dichotomy of "upper secondary general education for academically talented students and VET for the rest" to open up a more refined analytical perspective.

When we compare this instrument with Romano Müller's rating and the level of previous education required (*construct validation*) and consider the results of our empirical analysis of the factors 'length of VET', 'type of lower secondary education attended', and 'achieved competencies' (*criteria validation*), we can conclude that the 2005 rating is sufficiently valid on the whole and that the rating system adequately describes the intellectual demands of apprenticeships in a condensed form. Previous studies considering the intellectual demands of initial VET have confirmed the analytical value of the present classification system. The studies that have taken this particular factor into account have focused on the transition from lower to upper secondary education (Hupka, 2003; Meyer, 2003a, 2003b; Meyer & Stalder, 2005), on stress and satisfaction during VET (Stalder, 2003, forthcoming), on VET dropout and changing apprenticeships (Schmid, 2010; Schmid & Stalder, 2008; Stalder, 2009; and Stalder & Schmid, 2006), on the completion of upper secondary education (Stalder, Meyer, & Hupka-Brunner, 2008), and on the transition to the labour market (Bertschy, Cattaneo, & Wolter, 2009; B. Müller & Schweri, 2009; Schweri & Müller, 2009.

The published findings clearly underline that opportunities and risks in terms of access to VET, the course of VET, and the subsequent transition to employment take a different shape depending on the respective level of demands. In particular, we observe a divergence between occupations with low intellectual demands, on the one hand, and medium to high intellectual demands, on the other. The most demanding apprenticeships are more likely to be available to young women, youths from families with high social status, Swiss natives, youths who graduated from the advanced tracks of lower secondary education and have very good PISA reading skills, whereas young men, the socially disadvantaged, youths with migration background, graduates from the basic track of lower secondary education and those with poor reading skills are more likely to wind up in apprenticeships with low to medium demands (Hupka, 2003) Interestingly enough, there are only minor differences in educational achievements between those that directly enter an apprenticeship with low intellectual demands after compulsory education and those who attend an intermediate or preparatory training programme (Meyer, 2003a). Youths who pursue apprenticeships with medium or high demands more frequently complete them in a linear fashion, i.e. without dropping out, interrupting VET or switching to another apprenticeship, compared to youths learning occupations with low demands (Stalder & Schmid, 2006). Moreover, youths enrolled in intellectually demanding VET who decide to terminate their apprenticeship contract are more likely find an alternative solution than their peers in less demanding apprenticeships (Schmid, 2010). In the same vein, youths learning demanding occupations more frequently find employment in the occupation trained for upon completion of VET compared to their counterparts in less demanding VET (Bertschy et al., 2009).

The results of the validation suggest that the 2005 rating conducted in the canton of Berne can be applied to all Swiss language regions. Since VET in Switzerland is regulated at the federal level, it seems fair to assume that the intellectual demands of an apprenticeship in a specific occupation are the same across all Swiss language regions. This assumption was confirmed

for the canton of Berne since no noteworthy differences were observed between its German- and French-speaking parts in the first rating. Yet the issue would require closer examination. Nevertheless, the fact that data for the whole of Switzerland was used for construct and criterion validation allows to conclude that the rating can be applied to all of Switzerland.

Some thought was given as to whether classification based on demands might be used as an instrument in career counselling. The rating system would probably be of only limited use in this context as a supplement to other indicators for assessing the intellectual demands of initial VET (e.g. length of VET, type of lower secondary education attended). It must again be emphasized that the rating does not take other key factors influencing choice of occupation and apprenticeship into account, such as interests, practical skills, personal and social skills, individual compatibility with the learning environment in a company, regional differences etc.

Finally, it must be noted that the rating must again be reviewed, and adjusted accordingly, in the light of recent developments in the VET landscape. Changes that come to mind are, for instance, a validation based on the curricular content and educational objectives of VET programmes and a rating procedure involving career counsellors from all three language regions. Readjustment is all the more urgent since, in the wake of the new Swiss VET law of 1 January 2004, all previous provisions governing VET have been and still are being reviewed and replaced by new regulations, curricula and, in some cases, also pilot VET programmes (Table 6; cf. Nägele & Stalder, 2011)

The VET reform has multiple consequences. Traditional apprenticeships are disappearing, are being integrated into new VET programmes or are being based on revised curricula. At the same time, new apprenticeships are being created. In addition, a significant number of new two-year VET options have been developed since the mid-2000s that give academically less talented youths with practical skills the opportunity to acquire a basic VET certificate (Eidgenössischer Berufsattest – EBA). We can assume that those EBA apprenticeships, 36 as of Jan. 20ll, will rate at the lower end of the intellectual demands scale, moving the formerly less demanding apprenticeships resulting in a Swiss Federal Proficiency Certificate (EFZ) to the middle of the scale. For the time being, how the most recent trends in education policy will affect the demands and thus the ranking of individual VET programmes remains an open question. Specifically, it remains to be seen whether all EBA apprenticeships actually do rate at the lower end of the demands scale and to what extent we can draw a sharp distinction between EBA and EFZ apprenticeships in terms of intellectual demands. An update of the rating is therefore certainly necessary for research purposes. At the same time, it seems a fair guess that we can expect such an update to raise potentially controversial political issues.

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8 ANNEX

Table 6
Rating 2005, list of occupations in four languages

English	German	French	Italian	Level of demands 2005
Plant and mechanical engineering technicians	Anlagen- und Apparatenbauer/in	Constructeur d'appareils industriels	Costruttore d'impianti e apparecchi	4
Optometrist	Augenoptiker/in	Opticien	Ottico	5
Auto body painter	Autolackierer/in	Peintre en automobiles	Verniciatore di carrozzerie	1
Automation technician	Automatiker/in	Automaticien	Operatore in automazione	5
Automotive mechatronics technician	Automechaniker/in	Mécanicien d'automobiles	Meccanico d'automobili	4
Auto mechanic	Automonteur/in	Réparateur d'automobiles	Riparatore di autoveicoli	2
Baker/ pastry cook	Bäcker-Konditor/in	Boulanger-pâtissier	Panettiere-pasticciere	1
Insulation worker	Bauisoleur/in	Etancheur	Asfaltista	1
Construction equipment mechanic	Baumaschinenmechaniker/in	Mécanicien en machines de chantier	Meccanico di macchine edili	3
Architectural draughtsperson	Bauzeichner/in	Dessinateur en génie civil	Disegnatore del genio civile	5
Tailor/dressmaker	Bekleidungsgestalter/in	Créateur de vêtements	Creatore d'abbigliamento	2
Horse groom/rider	Bereiter/in	Ecuyer	Cavallerizzo	3
Concrete mason	Betonwerker/in	Constructeur d'éléments préfabriqués	Produttore di elementi prefabbricati	1
Facility manager	Betriebspraktiker/in	Praticien d'exploitation	Praticante d'esercizio	1
Floor layer	Bodenleger/in	Poseur de revêtements de sols	Posatore di pavimenti	1
Boat builder	Bootbauer/in	Constructeur de bateaux	Costruttore navale	3
Bookseller	Buchhändler/in	Libraire	Libraio	5
Auto body mechanic	Carrosseriespengler/in	Tôlier en carrosserie	Lattoniere da carrozzeria	2
Chemical laboratory assistant Chemical technician	Chemikant/in	Opérateur en chimie	Preparatore chimico tecnico	3
Hairdresser	Coiffeur/se	Coiffeur	Parrucchiere	1
Roofer	Dachdecker/in	Couvreur	Copritetto	2
Decorator	Dekorationsgestalter/in	Décorateur-étalagiste	Decoratore-espositore	3
Dental assistant	Dentalassistent/in	Assistante dentaire	Assistente dentale	3

Table 6 (cont).

English	German	French	Italian	Level of demands 2005
Druggist (non-dispensing)	Drogist/in	Droguiste	Droghiere	5
Printer	Drucktechnologe/-technologin	Techno-Imprimeur	Technologo di stampa	3
Electrical fitter	Elektromonteur/in	Monteur-électricien	Montatore elettricista	4
Electronics technician	Elektroniker/in	Electronicien	Elettronico	6
Electrical worker	Elektropraktiker/in	Electricien-practicien	Elettricista-praticante	2
Electrical planner	Elektrozeichner/in	Dessinateur-électricien	Disegnatore-elettricista	5
Health care assistant	Fachangestellte/r Gesundheit	Assistant en soins et santé communautaire CRS	Operatore socio-sanitario CRS	3
Auto electrician/electronics technician	Fahrzeug-Elektriker/in-Elektroniker/in	Electricien-électronicien en véhicules	Elettricista-elettronico per autoveicoli	4
Vehicle body builder	Fahrzeugschlosser/in	Serrurier sur véhicules	Fabbro di veicoli	2
Florist	Florist/in	Fleuriste	Fiorista	2
Forest manager	Forstwart/in	Forestier-bûcheron	Selvicoltore	1
Photo technician	Fotofach-Angestellte/r	Employé spécialisé en photographie	Impiegato specializzato in fotografia	3
Photographer	Fotograf/in	Photographe	Fotografo	4
Galvanizer	Galvaniker/in	Electroplaste	Galvanostegista	2
Gardener	Gärtner/in	Horticulteur	Giardiniere	1
Surveyor	Geomatiker/in	Géomaticien	Geomatico	5
Goldsmith	Goldschmied/in	Bijoutier	Orefice	2
Graphic designer	Grafiker/in	Graphiste	Grafico	4
Weaver	Handweber/in	Tisserand	Tessitore a mano	2
In-home caregiver	Hauspfleger/in	Aide familiale	Aiuto familiare	3
Building service technician	Haustechnikplaner/in	Projeteur en technique du bâtiment	Progettista nella tecnica degli impianti	4
Housekeeping manager	Hauswirtschafter/in	Gestionnaire en économie familiale	Impiegato d'economia domestica collettiva	2
Heating technician	Heizungsmonteur/in	Monteur en chauffage	Montatore di riscaldamenti	2
Hotel services assistant (EFZ)	Hotelfachfrau/-mann EFZ	Spécialiste en hôtellerie CFC	Impiegata d'albergo AFC	2
IT technician (EFZ)	Informatiker/in EFZ	Informaticien CFC	Informatico AFC	6
Chimney sweep	Kaminfeger/in	Ramoneur	Spazzacamino	3
Clerk (basic track education)	Kaufmann/-frau B (Grundansprüche)	Employé de commerce B (formation de base)	Impiegato di commercio B (formazione di base)	3
Clerk (advanced track education)	Kaufmann/-frau E (erweiterte Ansprüche)	Employé de commerce E (formation élargie)	Impiegato di commercio E (formazione estesa)	6

Table 6 (cont).

English	German	French	Italian	Level of demands 2005
Ceramic/pottery maker	Keramikmaler/in	Peintre sur céramique	Pittore su ceramica	1
Early childhood teacher	Kleinkindererzieher/in	Educatrice pour petits enfants	Educatrice della prima infanzia	4
Cook	Koch/Köchin	Cuisinier	Cuoco	2
Pastry cook/confectioner	Konditorin-Confiseurin	Pâtissier-confiseur	Pasticciere-confettiere	1
Construction mechanic	Konstrukteur/in	Constructeur	Costruttore	6
Beautician	Kosmetiker/in	Esthéticienne	Estetista	2
Laboratory technician	Laborant/in	Employé de laboratoire	Preparatore di laboratorio	5
Agricultural mechanic	Landmaschinenmechaniker/in	Mécanicien en machines agricoles	Meccanico di macchine agricole	4
Landscape draughtsperson	Landschaftsbauzeichner/in	Dessinateur-paysagiste	Disegnatore paesaggista	4
Farmer	Landwirt/in	Agriculteur	Agricoltore	3
Truck driver	Lastwagenführer/in	Conducteur de camion	Conducente di autocarri	3
Food technician	Lebensmitteltechnologe/-technologin	Technologue en denrées alimentaires	Tecnico alimentarista	3
Logistics assistant	Logistikassistent/in	Gestionnaire en logistique	Impiegato in logistica	3
Painter	Maler/in	Peintre en bâtiment	Pittore	1
Brick layer	Maurer/in	Maçon	Muratore	1
Production mechanic	Mechapraktiker/in	Mécapracticien	Meccanico-praticante	1
Medical laboratory technician	Medizinlaborant/in	Laborantine médicale	Laboratorista medica	5
Medical assistant	Medizinische/r Praxisassistent/in	Assistante médicale	Assistente di studio medico	3
Multi-media specialist	Mediamatiker/in	Médiamaticien	Mediamatico	6
Metalworker	Metallbauer/in	Constructeur métallique	Metalcostruttore	2
Butcher	Metzger/in	Boucher-charcutier	Macellaio-salumiere	1
Micromechanic	Mikromechaniker/in	Micromécanicien	Micromeccanico	4
Dairy technician	Milchtechnologe/technologin	Technologue en industrie laitière	Tecnologo dell''industria lattiera	2
Electrical installer	Montage-Elektriker/in	Electricien de montage	Elettricista di montaggio	2
Motor equipment mechanic	Motorgerätemechaniker/in	Mécanicien d'appareils à moteur	Meccanico d'apparecchi a motore	3
Motorcycle mechanic	Motorradmechaniker/in	Mécanicien en motocycles	Meccanico di motoveicoli	3
Multi-media electronics technician	Multimediaelektroniker/in	Electronicien en multimédia	Elettronico multimediale	5

Table 6 (cont).

English	German	French	Italian	Level of demands 2005
Electrician for electrical and telecommunications infrastructure	Netzelektriker/in	Electricien de réseau	Elettricista per reti di distribuzione	3
Caregiver	Pflegeassistent/in	Aide soignante	Aiuto infermiere	1
Pharmacy assistant	Pharma-Assistent/in/in	Assistant en pharmacie	Assistente di farmacia	3
Tiler	Plattenleger/in	Carreleur	Piastrellista	1
Graphic designer	Polygraf/in	Polygraphe	Poligrafo	5
Polymechanic	Polymechaniker/in	Polymécanicien	Polimeccanico	4
Restaurant services assistant	Restaurationsfachmann/-frau EFZ	Spécialiste en restauration CFC	Impiegata di ristorazione AFC	2
Plumber	Sanitärmonteur/in	Monteur sanitaire	Montatore d'impianti sanitari	3
Smith	Schmied/in	Forgeron	Fabbro-ferraio	1
Cabinet maker	Schreiner/in	Menuisier/Ebéniste	Falegname	4
Sheet metal worker	Spengler/in	Ferblantier	Lattoniere	2
Sheet metal worker-plumber	Spengler/in-Sanitärinstallateur/in	Ferblantier-installateur sanitaire	Lattoniere-installatore d'impianti sanitari	3
Road construction operative	Strassenbauer/in	Constructeur de routes	Costruttore stradale	2
Veterinary assistant	Tiermedizinische/r Praxisassistent/in	Assistante en médecine vétérinaire	Assistente di studio veterinario	3
Animal keeper	Tierpfleger/in	Gardien d'animaux	Guardiano d'animali	1
Clockmaker	Uhrmacher/in	Horloger	Orologiaio	3
Viticulturist	Winzer/in	Viticulteur	Viticoltore	2
Dental assistant	Zahnmedizinische/r Assistent/in	Assistante en médecine dentaire	Aiuto dentista	3
Dental technician	Zahntechniker/in	Technicien pour dentiste	Odontotecnico	4
Carpenter	Zimmermann/Zimmerin	Charpentier	Carpentiere	2
Train conductor	Zugbegleiter/in	Agent de train	Agente scortatreno	2
Bike mechanic	Zweiradmechaniker/in	Mécanicien deux-roues	Meccanico di cicli	2

Table 7
State of the VET reform as of September 2010; current VET regulations

Occupation in 2005	Demands	Length in years	In effect as of	Repealed as of	Current occupation/ VET ordinance*
Plant and mechanical engineering technicians	4	4	01/01/2002		
Optometrist	5	4		31/12/2010	Optometrist (EFZ**)
Auto body painter	1	3		31/12/2005	Auto body painter (EFZ)
Automation technician	5	4		31/12/2008	Automation technician (EFZ)
Automotive mechatronics technician	4	4		31/12/2006	Automotive mechatronics technician (EFZ)
Auto mechanic	2	3		31/12/2006	Auto mechanic (EFZ)
Baker/ pastry cook	1	3	01/01/1998		
Insulation worker	1	3		31/12/2007	Construction specialist – sealing and insulation (EFZ)
Construction equipment mechanic	3	4		31/12/2006	Construction equipment mechanic (EFZ)
Architectural draughtsperson	5	4		31/12/2009	Draughtsperson (EFZ)
Tailor/dressmaker	2	3	01/01/2002		
Horse groom/rider	3	3	01/04/1988		
Concrete mason	1	3		31/12/2009	Concrete mason (EFZ)
Facility manager	1	3		31/12/2006	Facility manager (EFZ)
Biological laboratory technician	5	3		31/12/2007	Laboratory technician (EFZ)
Floor layer	1	3	01/01/2002		
Boat builder	3	4	01/01/2002		
Bookseller	5	3		31/12/2008	Bookseller (EFZ)
Auto body mechanic	2	4		31/12/2005	Auto body mechanic (EFZ)
Chemical laboratory assistant	5	3		31/12/2007	Laboratory technician (EFZ)
Chemical technician	3	3		31/12/2005	Chemical and pharmacy technician (EFZ)
Hairdresser	1	3		31/12/2005	Hairdresser (EFZ)
Roofer	2	3	01/01/2002		
Decorator	3	4		31/12/2009	Interior Designer (EFZ)
Dental assistant	3	3		31/12/2009	Dental assistant (EFZ)
Retail sales worker	4	3	01/01/2005		
Druggist (non-dispensing)	5	4	01/07/1996		
Printer	3	4	01/03/2001		
Electrical fitter	4	4		31/12/2006	Electrical fitter (EFZ)
Electronics technician	6	4		31/12/2008	Electronics technician (EFZ)
Electrical worker	2	3		31/12/2008	Electrical worker (EFZ)
Electrical planner	5	4		31/12/2006	Electrical planner EFZ
Health care assistant	3	3		31/12/2008	Health care assistant (EFZ)
Auto electrician/electronics technician	4	4	01/07/1994		
Vehicle body builder	2	4		31/12/2009	Vehicle body builder (EFZ)
Florist	2	3		31/12/2007	Florist (EFZ)
Forest manager	1	3		31/12/2006	Forest manager (EFZ)
Photo technician	3	3		31/12/2004	Photo technician (EFZ)
Photographer	4	4	01/01/1978		
Galvanizer	2	4		31/12/2009	Galvanizer (EFZ)
Gardener	1	3	01/08/2000		
Surveyor	5	4		31/12/2009	Surveyor (EFZ)
Goldsmith	2	4		31/12/2009	Goldsmith (EFZ)

Table 7 (cont).

Occupation in 2005	Demands	Length in years	In effect as of	Repealed as of	Current occupation/ new VET ordinance
Graphic designer	4	3		31/12/2009	Graphic designer (EFZ)
Weaver	2			1999	
In-home caregiver	3	3		31/12/2008	Health care assistant (EFZ)
Building service technician	4	4		31/12/2009	Building service technician – heating systems (EFZ)
Housekeeping manager	2	3		31/12/2004	Housekeeping manager (EFZ)
Heating technician	2	3		31/12/2007	Heating technician (EFZ)
Hotel services assistant (EFZ)	2	3	01/01/2005		
IT technician (EFZ)	6	4	01/01/2005		
Chimney sweep	3	3	01/03/2002		
Clerk (basic track education)	3	3	01/01/2003		
Clerk (advanced track education)	6	3	01/01/2003		
Ceramic/pottery maker	1	3	01/07/1984		
Early childhood teacher	4			~2006	Early childhood teacher (EFZ)
Cook	2	3		31/12/2009	Cook (EFZ)
Pastry cook/confectioner	1	1	01/03/2001		
Construction mechanic	6	4		31/12/2008	Construction mechanic (EFZ)
Beautician	2	3		31/12/2006	Beautician (EFZ)
Agricultural mechanic	4	4		31/12/2006	Agricultural mechanic (EFZ)
Landscape draughtsperson	4	4		31/12/2009	Draughtsperson (EFZ)
Farmer	3	3		31/12/2008	Farmer (EFZ)
Truck driver	3	3	01/12/2003		
Food technician	3	3	01/03/2001		
Logistics assistant	3	3		31/12/2006	Logistics assistant (EFZ)
Painter	1	3	01/01/1982		
Brick layer	1	3	01/03/1996		
Production mechanic	1	3		31/12/2008	Production mechanic (EFZ)
Medical laboratory technician	5				Biomedical laboratory technician (higher education)
Medical assistant	3	3		31/12/2009	Medical assistant (EFZ)
Multi-media specialist	6	4	01/06/2003		
Metalworker	2	4		31/12/2006	Metalworker (EFZ)
Butcher	1	3		31/12/2007	Butcher (EFZ)
Micromechanic	4	4	01/01/2002		
Dairy technician	2	3	01/07/2001		
Electrical installer	2	3		31/12/2006	electrical installer (EFZ)
Motor equipment mechanic	3	4		31/12/2006	Motor equipment mechanic (EFZ)
Motorcycle mechanic	3	4	01/01/2002		
Multi-media electronics technician	5	4	01/01/2000		
Electrician for electrical and tele-communications infrastructure	3	3	01/07/1996		
Caregiver	1				Currently regulated by the Swiss Red Cross; to be replaced by EBA***
Pharmacy assistant	3	3		31/12/2006	Pharmacy assistant (EFZ)
Tiler	1	3	01/03/1999		
Graphic designer	5	4		31/12/2006	Graphic designer (EFZ)
Polymechanic	4	4		31/12/2008	Polymechanic (EFZ)
Restaurant services assistant	2	3	01/01/2005		
Plumber	3	3		31/12/2007	Plumber (EFZ)
Smith	1	4		31/12/2006	Metalworker (EFZ)

Table 7 (cont).

Occupation in 2005	Demands	Length in years	In effect as of	Repealed as of	Current occupation/ new VET ordinance
Cabinet maker	4	4	01/01/2002		
Sheet metal worker	2	3		12/12/2007	Sheet metal worker (EFZ)
Sheet metall worker-plumber	3	4	01/01/1988		
Road construction operative	2	3		28/02/2008	Road construction operative (EFZ)
Veterinary assistant	3	3		31/12/2007	Veterinary assistant (EFZ)
Animal keeper	1	3		31/12/2009	Animal keeper (EFZ)
Clockmaker	3	4	01/01/2001		
Viticulturist	2	3		31/12/2008	Viticulturist (EFZ)
Dental technician	4	4		31/01/2008	Dental technician (EFZ)
Carpenter	2	3	01/01/2003		
Train conductor	2	3	01/01/1999		
Bike mechanic	2	3	01/01/2002		

*http://www.bbt.admin.ch/bvz/grundbildung/index.html?lang=de (27/09/2010)

** EFZ: Eidgenössiches Fähigkeitszeugnis = Federal VET Diploma

*** EBA: Eidgenössischer Berufsattest = two-year basic VET certificate